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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/536,788

05/26/2005

Christoph Merkl

MAT-3616

2872

30996

7590

03/29/2006

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EXAMINER

SARKAR, ASOK K

ART UNIT

PAPER NUMBER

2891

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/536,788	MERKL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Asok K. Sarkar	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 13-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/26/2005</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 15 and 24 are objected to because of the following informalities: The limitations of these claims are silent about the wavelength region of light under which the emissivity and reflectivity values are measured. The wavelength is assumed to be in the infrared ranges. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 13 – 15, 20, 21 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Flory, US 5,624,590 in view of Dutartre, US 5,994,676.

Regarding claims 13, 20, 21 and 25, Flory teaches a method of producing a calibration wafer having at least a predetermined emissivity, including the steps of:

- providing a wafer of semiconductor material;
- subjecting the bulk material of the wafer to at least one of doping with foreign atoms such as boron and generating lattice defects (inherent in the process of doping as taught by Dutartre in column 4, lines 33 – 44) to adjust the predetermined emissivity (emissivity can be adjusted exclusively via doping and generating lattice defects);

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- coating the wafer with a metallic layer to obtain a further optical characteristic in column 5, lines 11 – 21.

Regarding claim 14, Flory teaches further optical characteristic is a predetermined reflectivity in column 1, lines 44 – 46 since reflectivity and emissivity are related optical properties.

Regarding claim 15, Flory teaches emissivity values between 0.25 – 0.8 in column 9, lines 6 – 10.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flory, US 5,624,590.

Regarding claim 16, Flory teaches low resistivity heavily doped wafer, but fails to teach doping with foreign atoms and generating lattice defects is effected essentially homogeneously over the bulk material of the wafer.

However, it would have been obvious to one with ordinary skill in the art at the time of the invention that the heavily doped wafer will generate lattice defects essentially homogeneously over the bulk material of the wafer since resistivity is a bulk property of the material.

Regarding claim 22, Flory teaches foreign ion concentration of  $10^{15}$  atoms/cm<sup>3</sup>, but fails to teach the foreign ion concentration between  $10^{16} - 10^{19}$  atoms/cm<sup>3</sup>.

However, it would have been obvious to one with ordinary skill in the art at the time of the invention to judiciously adjust and control the doping concentration during the emissivity measurements through routine experimentation and optimization to achieve an optimum value (see MPEP 2144.05) and it would not yield any unexpected results.

Note that the specification contains no disclosure of either the critical nature of the claimed processes or any unexpected results arising therefrom. Where patentability

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is said to be based upon particular chosen methods or upon another variable recited in a claim, the Applicant must show that the chosen methods or variables are critical (*Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir., 1990)). See also *In re Aller, Lacey and Hall* (10 USPQ 233 – 237).

8. Claims 17 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flory, US 5,624,590 in view of Kokoschke, DE 3803336.

Flory teaches doped semiconductor but fails to teach doping with foreign atoms and generating lattice defects is effected in a predetermined region, wherein said predetermined region is a surface layer of the wafer.

Kokoschke teaches ion implantation of the wafer with reference to Fig. 1 on one surface of the wafer for the benefit of producing a test wafer for temperature measurements.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention that doping with foreign atoms and generating lattice defects is effected in a predetermined region, wherein said predetermined region is a surface layer of the wafer since the implantation is carried out at a predetermined depth from the surface for the benefit of producing a test wafer for temperature measurements as taught by Kokoschke.

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flory, US 5,624,590 in view of Champeteir, US 5,874,711.

Flory fails to teach effecting emissivity via a selection of the thickness of the wafer.

Champeteir teaches emissivity is determined by the thickness of the wafer for the benefit of measuring true temperature using a pyrometer in column 2, lines 20 – 30.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention that thickness should be considered as a variable for considering emissivity for the benefit of measuring true temperature using a pyrometer as taught by Champeteir in column 2, lines 20 – 30.

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flory, US 5,624,590 in view of Nenyeyi, US 5,628,564.

Flory teaches emissivity values between 0.2 and 0.9, but fails to teach reflectivity values.

Nenyeyi teaches that reflectivity values are 1 – emissivity value in column 2, line 28.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention that emissivity and reflectivity values are interrelated to each other.

11. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flory, US 5,624,590 in view of Frazer, US 4,321,299.

Flory teaches coating with Ti, but fails to teach cobalt.

Frazer teaches that emissivity can be increased by coating with a metal such as cobalt in column 3, line 50 for the benefit of increasing the infra – red emissivity of a material in column 3, lines 44 – 59.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Flory and use cobalt as a coating material for the benefit

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of increasing the infra – red emissivity of the wafer as taught by Frazer in column 3, lines 44 – 59.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Asok K. Sarkar  
March 23, 2006

Primary Examiner